

Work Order ID 69097

Friday, April 29, 2011 11:07:09 AM

Page 1

Item ID: D212-664-101

Accept

Revision ID:

Item Name: Crosstube Fwd

Start Date: 4/29/2011 Start Qty: 1.00

Required Date: 5/19/2011 Req'd Qty: 1.00

Reference:

Approvals:

Process Plan:

Date: 11-04-29

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr

Revision Nbr

D212-664-141

Rev D

100

0.00

DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D212-664-101

CHG003

110

0.00

Pick Kit

Packaging

Packaging

Memo

0.00

Packaging

120

0.00

BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio D212-664-101

D212 664 101 B 69097

CHG004 (ECN 11-549)
8/1/2010

JG 44 BG 11-5-10

JD

11-5-3

JD

11-5-3

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

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Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

Suloroy



QC

Memo

0.00

(4)

Quality Control

140

Crosstubes

0.00



Crosstubes

Memo

0.00

(4)

1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549, using drill table DT8577, set-up towers in hole #7 as per QSI 10

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

SAD
11-05-04

SAD

11-05-05

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Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat within 24 hours of bending and drilling

SAD 11/05/05

160

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

11/05/05 (1)

170

Outsource process - NDT per QSI038 4.1

0.00



Outsource2

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038
Issue P/O: 14013
LPI as per ASTM 1417 Level 2
Attach copy of NDT results to work order

CZ 11/05/05 (1)

W/O:		WORK ORDER CHANGES						
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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 	Receive & Inspect for Damage & Mat'l Certs Packaging	0.00							
Packaging	Memo	0.00							
Packaging	Ensure copy of NDT results attached to work order.								
190 	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control	Inspect for damage & ensure results are as per Dwg D212-664-141								

Handwritten signature
4/29/11 (1)

Handwritten initials 11-05-05

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

Spray Painting per QSI005 4.2

0.00



SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-141 with White Imron as per QSI 005 4.2

PRIME:

Start Time: _____

Finish Time: _____

PAINT:

Start Time: _____

Finish Time: _____

210

QC14- Inspect Spray Paint

0.00



QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

BT 11-05-06

Pto ->

M 11 05 09 ①

Dart Aerospace Ltd

WIO: 69097		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.05.08	200	Perm. change per DS2 9543 Prime + clean 2 inch strip on underside of X-tube for an inspection window	<i>[Signature]</i>	11.05.08 11.05.12		<i>[Signature]</i> 11/05/2011	<i>[Signature]</i> 11/05/2011

Part No: D 212-664-101 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220		0.00							
	Crosstubes					<u>11</u>	<u>11</u>	<u>05</u>	<u>09</u> ①
Crosstubes	Memo	0.00							
Crosstubes	1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe								
	2- Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs A/R 6398 Magnobond Batch: <u>116677 exp: 08/2011</u>								
	3- Torque bolts as per dwg <u>11 05 10</u> ①								
230		0.00							
	QC6- Inspect dimensions to drawing								
QC	Memo	0.00							
Quality Control									
240		0.00							
	Pick Kit								
Packaging	Memo	0.00							
Packaging									

11

11/5/11

W/O:		WORK ORDER CHANGES						
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Setup Start



Revision ID:

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Item Name: Crosstube Fwd

Start Date: 4/29/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/19/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

250

QC4- 100% Inspect kits for completeness

0.00

0.00 *Encls 10*

QC

Memo

Quality Control

260

Packaging

0.00



0.00

Packaging

Memo

Packaging

Identify and pack for shipping as per PPP D212-664-101

270

QC21- Final Inspection - Work Order Release

0.00



0.00

QC

Memo

Quality Control

*ME**11-05-11*

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

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Picklist Print

Friday, April 29, 2011 11:07:16 AM

Page 1

Work Order ID: 69097

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd




Start Date: 4/29/2011

Required Date: 5/19/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat KJ/DS
 IPP Rev:F 06-03-29 Remove Coments on Pick List JLM
 IPP Rev:G 07-04-30 As per Rev C JLM IPP Rev:H
 11.04.26 inspection strip ecn 11-549 EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status																		
D212-664-101TRN 		Manufactured	No	B68584		110	Each	0.0000	1	①	JW	11/05/03																			
Crosstube Turning Detail																															
D3595-063-450 		Manufactured	No			230	Each	98.4000	4	4.210526		11-05-09																			
RUBBER CUSHION																															
<table><tr><th>Location</th><th>Loc Qty</th><th>Loc Code</th></tr><tr><td>LG</td><td>52</td><td></td></tr><tr><td>67353</td><td>7</td><td></td></tr><tr><td>68893</td><td>45</td><td></td></tr><tr><td>LG055</td><td>46.4</td><td></td></tr><tr><td>68157</td><td>46.4</td><td></td></tr></table>														Location	Loc Qty	Loc Code	LG	52		67353	7		68893	45		LG055	46.4		68157	46.4	
Location	Loc Qty	Loc Code																													
LG	52																														
67353	7																														
68893	45																														
LG055	46.4																														
68157	46.4																														
MS21920-25 		Purchased	No			220	Each	52.0000	4	4		11-05-10																			
Clamp(per MIL-DTL-8783C)																															
MS21920-24 																															
D2893-1 		Manufactured	No			220	Each	15.0000	2	2		11-05-09																			
2.75 Support																															
<table><tr><th>Location</th><th>Loc Qty</th><th>Loc Code</th></tr><tr><td>LG050</td><td>52</td><td></td></tr><tr><td>116264</td><td>2</td><td></td></tr><tr><td>117279</td><td>50</td><td></td></tr></table>														Location	Loc Qty	Loc Code	LG050	52		116264	2		117279	50							
Location	Loc Qty	Loc Code																													
LG050	52																														
116264	2																														
117279	50																														

B# 67619

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
11.05.11		USE MS21920-24 (-25 are B10'd) - 26 too long	<i>[Signature]</i>	11.05.09	1	<i>[Signature]</i> 11.05.11 081.012	<i>[Signature]</i> wisty	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Work Order ID: 69097

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 4/29/2011

Required Date: 5/19/2011

Start Qty: 1.00

Required Qty: 1.00

D3428-1

Manufactured No

240 Each

13.0000

1

1

Placard

Location

Loc Qty

Loc Code

ST053

13

66115

1

66961

12

AN6-35A

Purchased No

240 Each

90.0000

4

4

BOLT

Location

Loc Qty

Loc Code

ST343

90

113422

10

116528

50

117441

30

AN6-36A

Purchased No

240 Each

105.0000

4

4

Bolt

Location

Loc Qty

Loc Code

ST343

105

117313

25

117441

80

MS21042L6

Purchased No

240 Each

334.0000

6

6

Nut

Location

Loc Qty

Loc Code

ST300

334

116373

5

116548

29

117343

300

Friday, April 29, 2011 11:07:17 AM

W/O:		WORK ORDER CHANGES						
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Parent Item: D212-664-101



Parent Item Name: Crosstube Fwd

Start Date: 4/29/2011

Required Date: 5/19/2011

Start Qty: 1.00

Required Qty: 1.00

AN960JD616

NAS1149D0663J

Purchased

No

240

Each

0.0000

18

18



Washer



MIT 29/

11/5/108

Friday, April 29, 2011 11:07:17 AM

Shop Packet Print

Page 3

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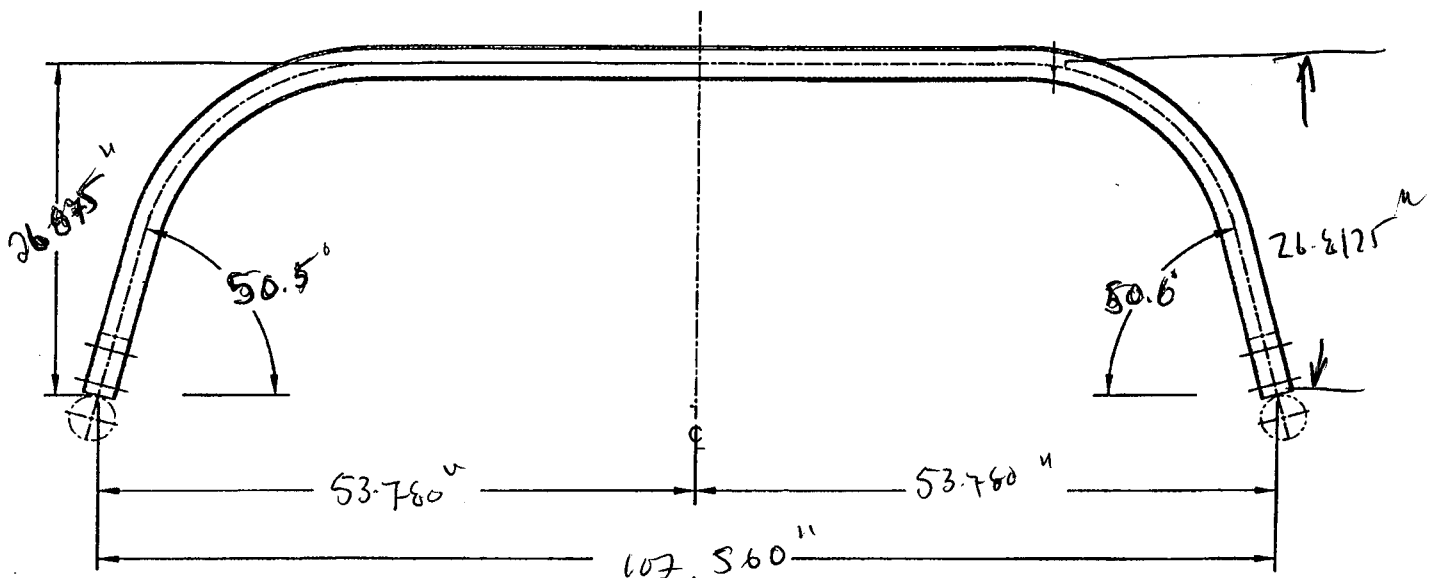
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DART AEROSPACE LTD	Work Order:	69097
Description: Crosstube High Fwd (205/212/412)	Part Number:	D212-664-101
Inspection Dwg: D212-664-141 Rev: D		Page 1 of 1

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7



Comments

QC15 Inspection	8
Date	11/15/04

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.31	Dimensions updated per Dwg Rev C	KJ/JM	
C	10.04.01	Dwg Rev updated	KJ	

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NOTE: Date & initial all entries

8. 7 6 5 4 3 2 1



Item	Qty -141	Qty -141B	Part Number	Description
1	X		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS
- WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS
6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF
D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE
SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND
MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT
HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 69097

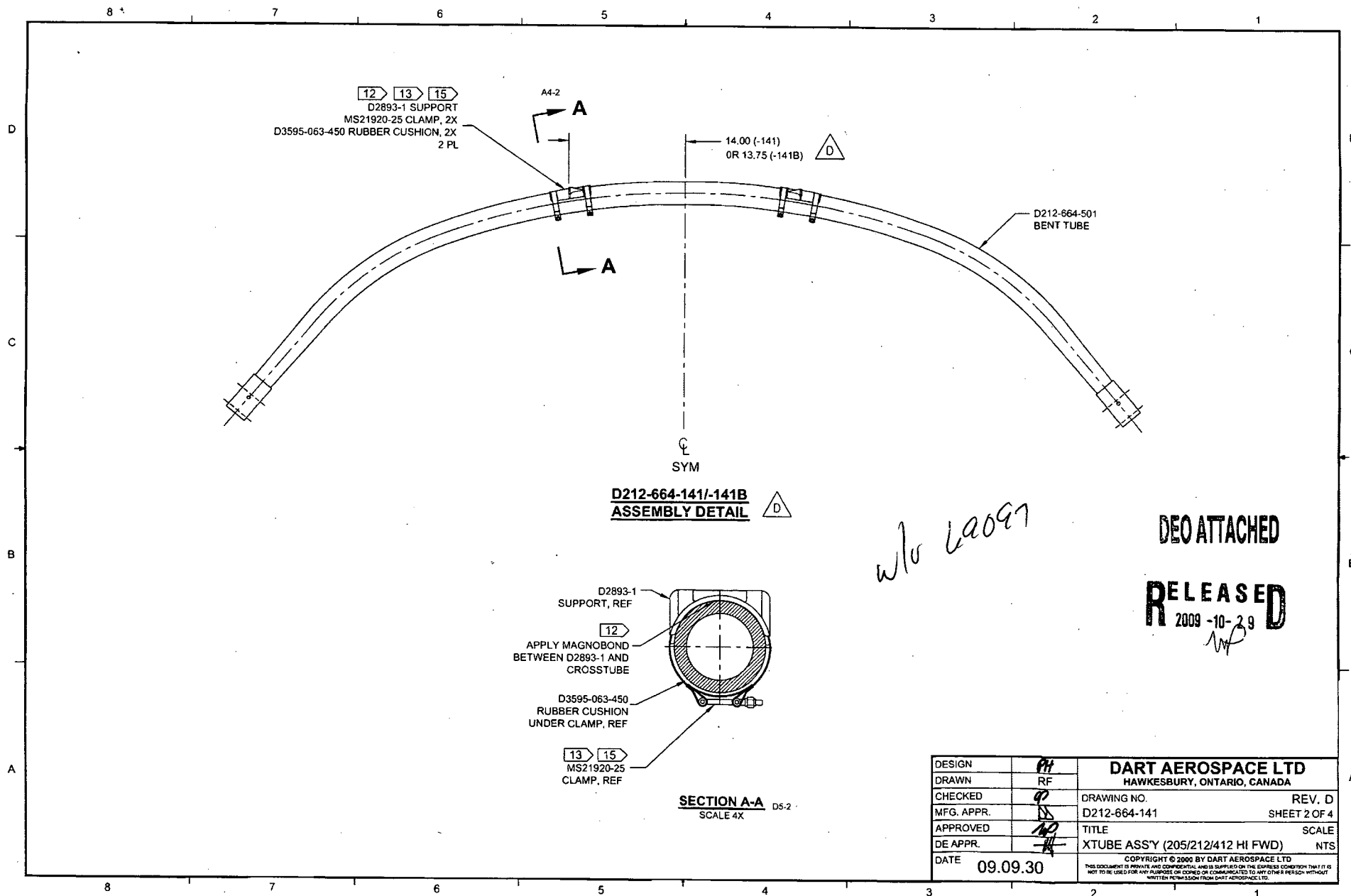
11-04-29

DEO ATTACHED

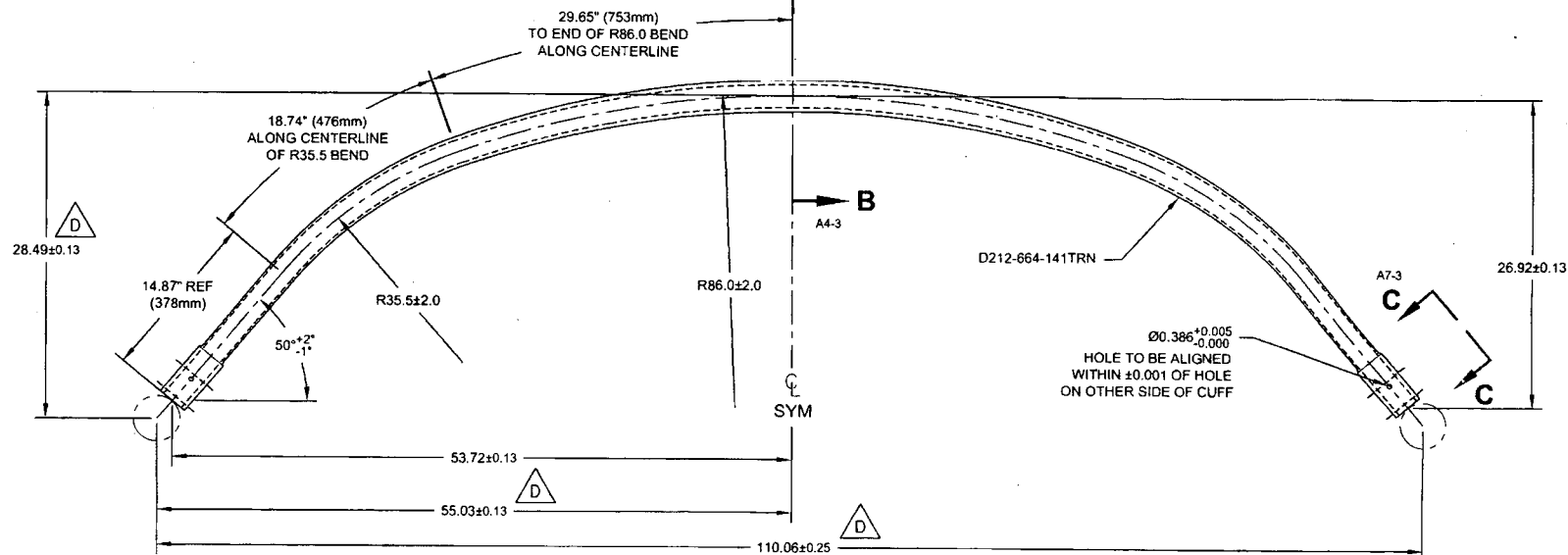
RELEASED
2009-10-29

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	97	DRAWING NO.	REV. D
MFG. APPR.	11	D212-664-141	SHEET 1 OF 4
APPROVED	11	TITLE	SCALE
DE APPR.	11	XTUBE ASSY (205/212/412 HI FWD)	NTS
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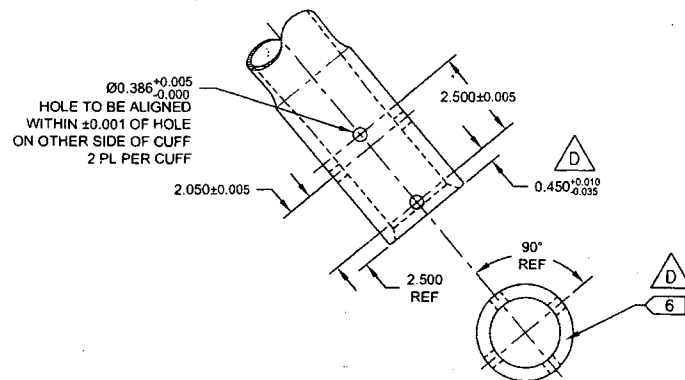
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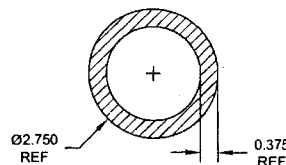
DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	90	DRAWING NO.	REV. D
MFG. APPR.	SS	D212-664-141	SHEET 2 OF 4
APPROVED	12	TITLE	SCALE
DE APPR.	12	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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D212-664-501
BENDING AND DRILLING DETAIL



VIEW C-C: CUFF DETAIL
SCALE 3X



SECTION B-B
SCALE 4X

w/0 69097

DEO ATTACHED

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2009-10-29

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. D
MFG. APPR.	DS	D212-664-141	SHEET 3 OF 4
APPROVED	JP	TITLE	SCALE
DE APPR.	CH	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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DRAWING NO. D212-664-141	TITLE XTUBE ASSY (205/212/412 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED <i>UP</i>	MFG. APPR. <i>R</i>	APPROVED <i>MP</i>	DE APPR. <i>H</i>			
DATE 11.04.07	DATE 11.07.11	DATE 11.04.12	DATE 11/09/12	DATE 11.04.12			

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

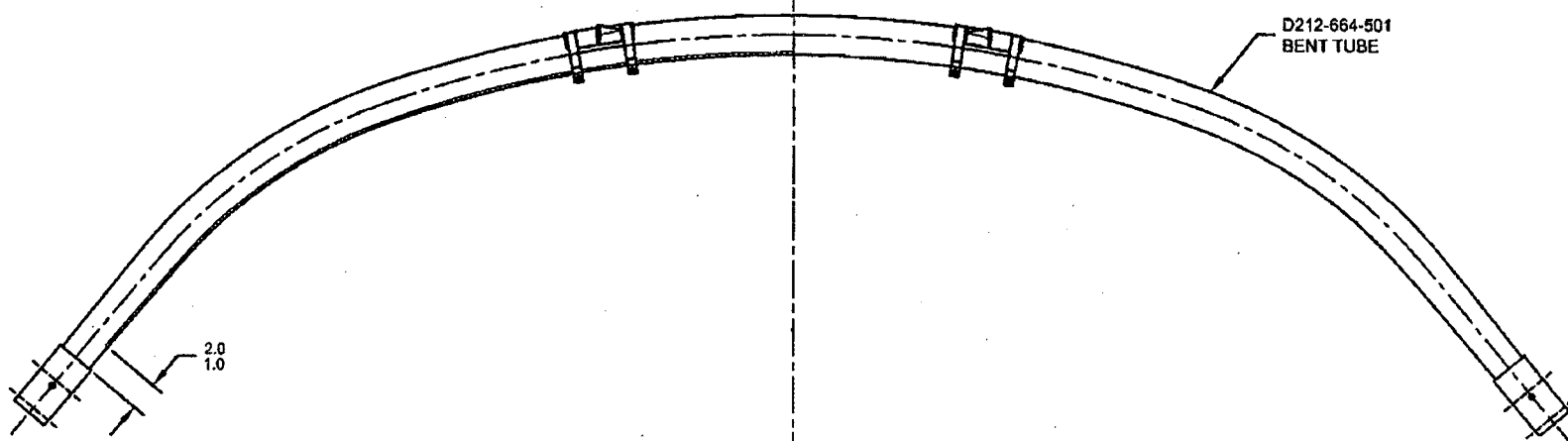
W/O 69097

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DRAWING NO. D212-664-141	TITLE XTUBE ASSY (205/212/412 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-141-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>CP</i>	MFG. APPR. <i>E</i>	APPROVED <i>WMD</i>	DE APPR. <i>WMD</i>		
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12		

IS:

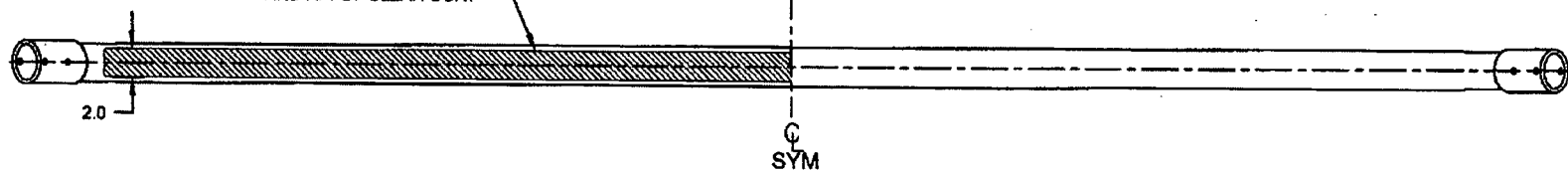


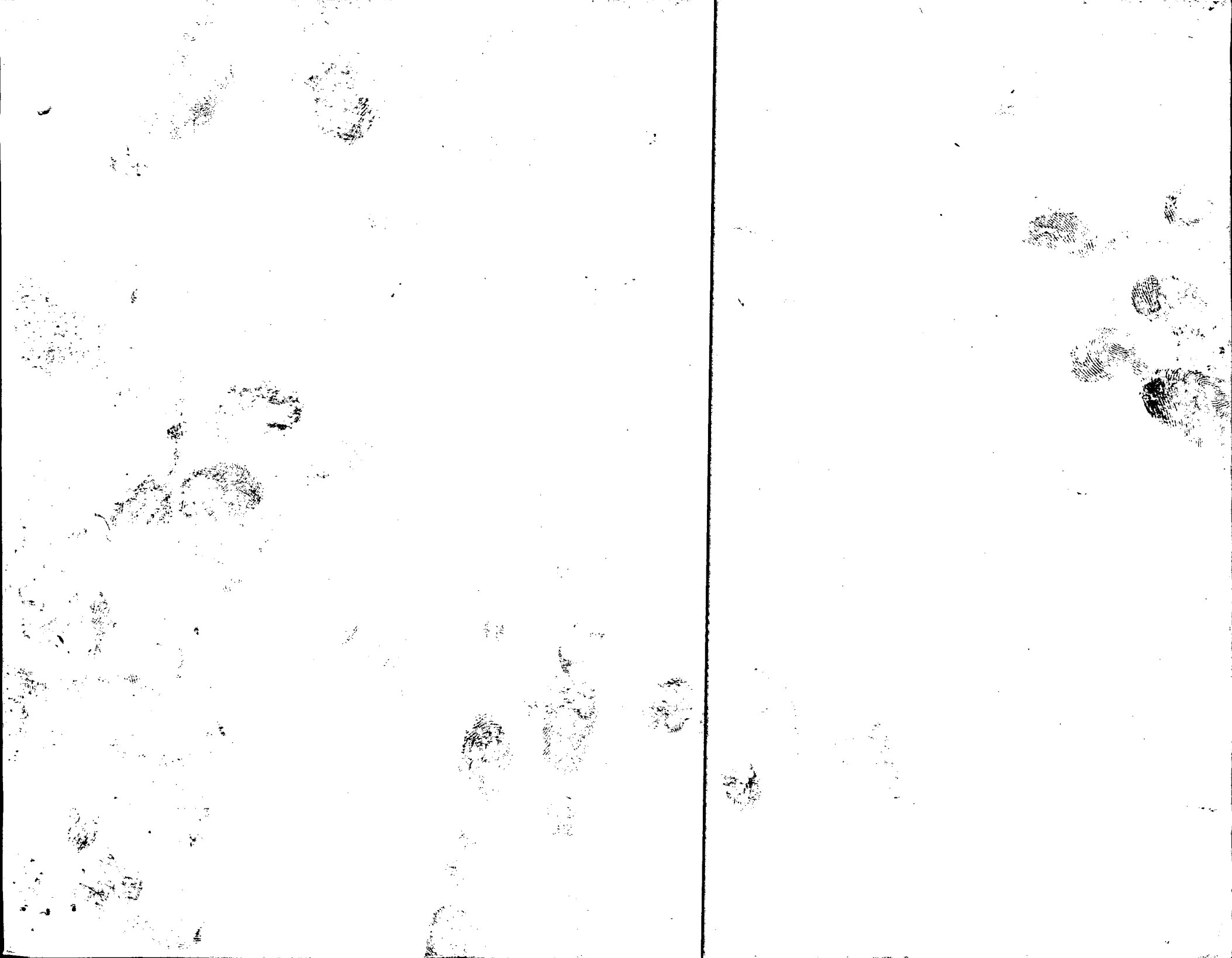
WAS:

**D212-664-141/-141B
ASSEMBLY DETAIL**

Wb 69097

MASK AREA PRIOR TO PAINTING,
REMOVE MASKING AFTER PAINT
AND APPLY CLEAR COAT







UREN

LIQUID PENETRANT TEST REPORT

P- 05604

DART AEROSPACE
 LINDA LACELLE / CHANTALE / IAN
 1270, ABERDEEN ROAD
 HAWKES BURY
 ON
 WET FLUORESCENT LIQUID PENETRANT INSPECTION ON 5 CROSS TUBES
 EXAMINED SEE BELOW

DATE MAY-05-2011
 ACUREN JOB NO. 188-11-02119
 PO/VO NO. 14013
 WORK LOCATION AS ADDRESS
 ACCEPTANCE STD. ASTM1417/QSI-038
 REV./DATE 2005

PAGE 1 OF 1
 TIME AM ☒ PM ☐

DESCRIPTION PROCEDURE NO. LT-002 REV./DATE 2008 TECHNIQUE NO. LT-002 REV./DATE 2008
 NO. MATERIAL THICKNESS N/A
 PERFORMED A WET FLUO L.P.I. ON 100% OF THE EXTERNAL SURFACE ON 5 CROSS TUBES

DETAILS
☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
 BRAND MAGNAFLUX BLACK LIGHT S/N 13798 OUTPUT > 1000 μ W/CM² ☒ AMBIENT < 2 fc
 RANT ZL-67 MINIMUM DWELL TIME 10 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
 RANT REMOVER H₂O MINIMUM DRY TIME > 10 MIN. OTHER
 OPER SKD-52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N CAL DUE DATE AUG/2011
 OPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

SURFACE
 CE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
 CE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/ 50°F ☒ 10°C/ 50°F TO 52°C/ 125°F ☐ > 52°C/ 125°F

ILTS- (☐ METRIC ☐ IMPERIAL)
 COMMENTS
 CROSS TUBE W.O. ID 68200 ✓
 CROSS TUBE W.O. ID 68201 ✓
 CROSS TUBE W.O. ID 69097 ✓
 CROSS TUBE W.O. ID 69098 ✓
 CROSS TUBE W.O. ID 68583 ✓
 ITEM ID D212-664-101 FWD
 ITEM ID D212-664-101 FWD
 ITEM ID D212-664-101 FWD
 ITEM ID D212-664-101 FWD
 ITEM ID D212-664-101 FWD
 ITEM ID D212-664-101 FWD
 NO RELEVANT INDICATION WAS DETECTED PER APPLICABLE STANDARD
 ET 11-0505

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 Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as warranties or guarantees. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.
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 (PRINT): JVES DESROSIERS
 CGSB LEVEL 1ST TECHNICIAN 2 CGSB LEVEL 2ND TECHNICIAN
 CGSB REG. NO. 3049 CGSB REG. NO.
 DTR # E44642
 REPORT REVIEWED BY:
 NAME INITIALS

DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS IIN-D212-664 Rev. F AND
INSTRUCTIONS FOR CONTINUOUS AIRWORTHINESS ICA-D212-664 Rev. 6

REF. CANADIAN STC: SH01-9

REF. FAA STC: SR01298NY

REF. EASA STC: EASA.IM.R.S.01307 **REFERENCE ONLY**

For D212-664-101/-201 High Fwd/Aft Crosstube at CHG 004 or later, and D412-664-203 Aft Crosstubes at CHG 007 or later, an inspection window has been added on the underside of the crosstube to facilitate inspection.

IMPORTANT NOTE: If a D212-664-101/-201 or D412-664-203 Crosstube was stripped of paint, it should now be refinished as follows:

- 1) Apply chemical conversion film material (Alodine 1200 or 1201) per MIL-C-5541 and one coat of MIL-P-85582 or MIL-P-23377 primer.
- 2) Mask underside of crosstube as per hatched area shown in Figures 1 and 2 as applicable.
- 3) Paint outside surfaces of crosstube by applying 2-3 coats of MIL-C-85285 polyurethane paint to match original finish.
- 4) Apply clear coat on inspection window (hatched area).

Additionally, on D412-664-203 Aft Crosstubes at CHG 007 or later, the D2856-600-1009 Abrasion Strips have been removed, and D3189-1 Chafing Shields have been bonded onto the crosstubes using Proseal 890. For D412-664-203 Aft Crosstubes at CHG 007 or later, amend Parts List of IIN-D212-664 Section 5.1 and ICA-D212-664 Section 32.11.1 as follows:

Remove:

Item	QTY -203	Part Number	Description
31	2	* D2856-600-1009	ABRASION STRIP

If a D3189-1 Chafing Shield is being re-installed on the crosstube, it should now be re-installed as follows:

- 1) Follow section 32.1 of ICA-D212-664 for the removal of the crosstubes from the helicopter.
- 2) Remove the qty(2) MS21920-28 Clamps from the crosstube that fasten the D3189-1 Chafing Shields to the crosstube (ref. section 32.5 of ICA-D212-664).
- 3) Remove the D2856-600-1009 Abrasion Strip from the crosstube per section 32.7 of ICA-D212-664.
- 4) Inspect the crosstube surface where the chafing shields and abrasion strips were installed for corrosion and mechanical damage per items 5.3.1 and 5.3.2 of the 300 hour inspection. Repair damage within acceptable limits per item 5.3.3 of the 300 hour inspection. Touch up finish per item 5.3.9 of 300 hour inspection. If crosstube was stripped of paint, refer to instructions below for suitable refinishing of crosstube.
- 5) Apply a 0.02" to 0.04" (0.5-1.0 mm) thick layer of Proseal 890 on the concave surface of D3189-1 Chafing Shields and let cure per manufacturer's instructions.
- 6) Once the Proseal on the D3189-1 Chafing Shields is cured, apply a thin layer of Proseal 890 on the crosstube to cover the area where the Chafing Shields will be installed.
- 7) Locate the D3189-1 Chafing Shield as shown in Figure 3. Ensure that the overlapping edge of the chafing shield is located at approximately 60° from bottom vertical to prevent deterioration of the rubber bumpers. Be sure to eliminate any air gaps.
- 8) Position and tighten the clamps to a torque of 80-100 in-lb (9.0-11.3 N-m).
- 9) Allow the assembly to cure for 12 hours.
- 10) Re-install the D412-664-203 crosstube per section 32.2 of ICA-D212-664.

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED

BY:

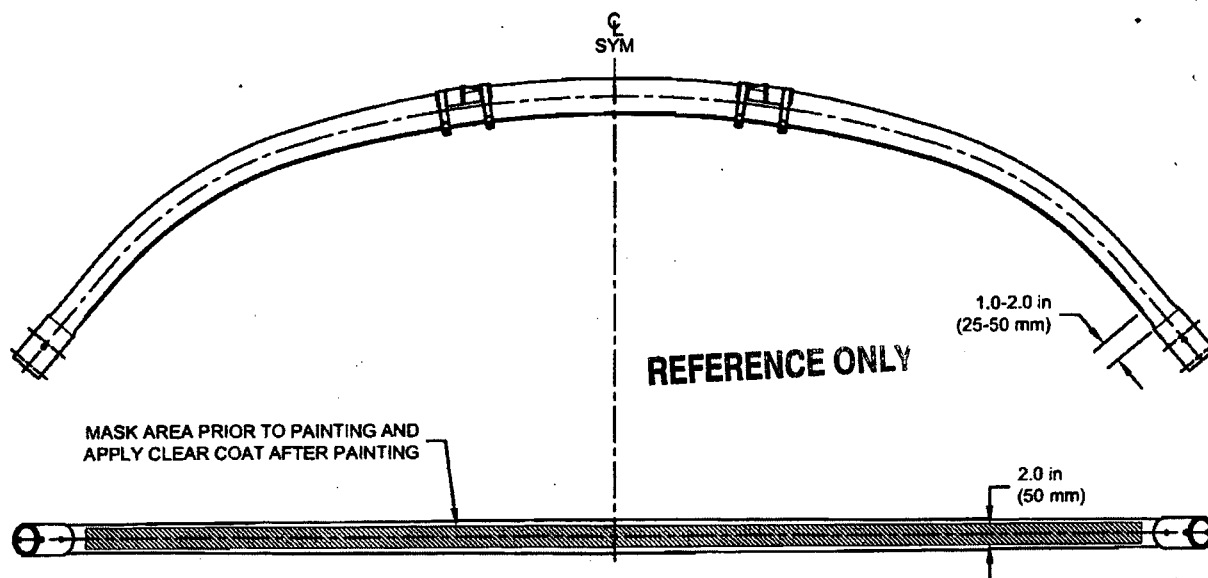
D. SHEPHERD (DE # 02)

DATE: 11.04.01

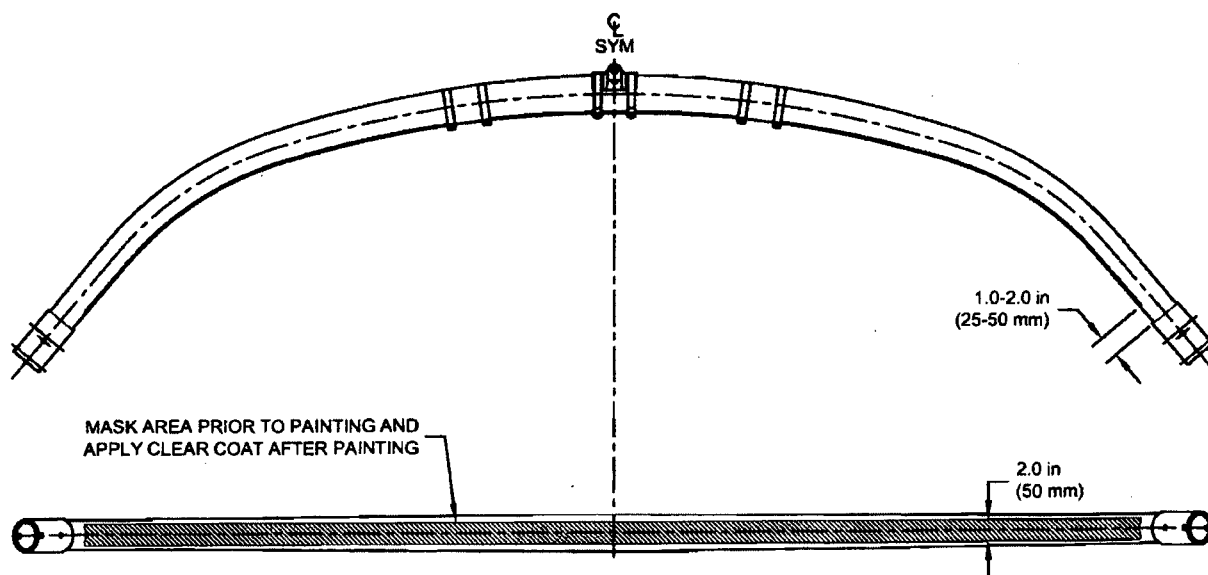
CERT. NO.: SH01-9

ISSUE NO.: 3

A	NEW ISSUE	MB	11.04.01
REV.		BY	DATE
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		DSI 9549	SHEET 1 OF 3
APPROVED		TITLE	SCALE
DE APPR.		D212-664 FINISHING CHANGE	NTS
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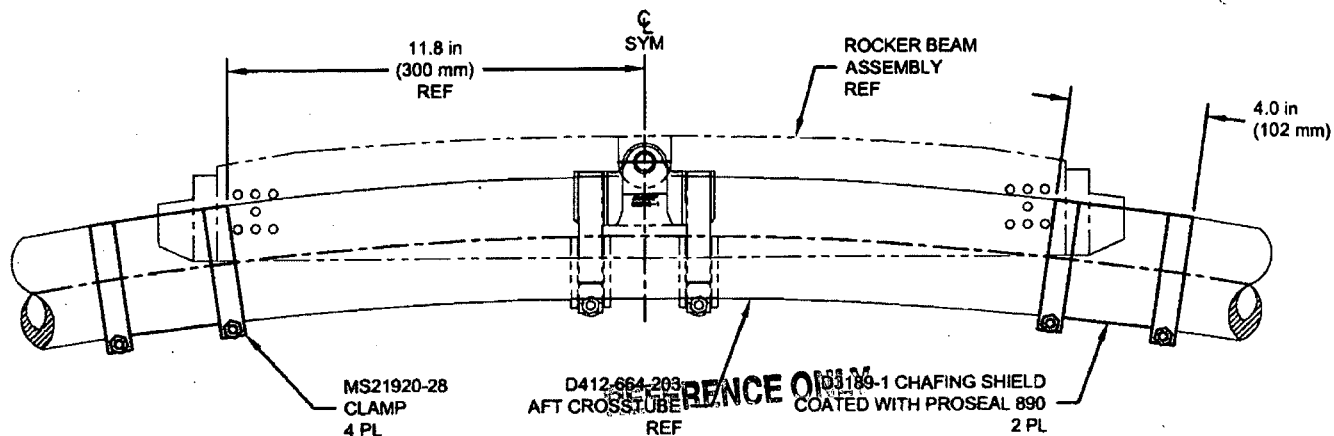
**FIGURE 1 - INSPECTION WINDOW ON
D212-664-101/-201 CROSSTUBES**



**FIGURE 2 - INSPECTION WINDOW ON
D412-664-203 CROSSTUBES**

CANADA DEPARTMENT OF TRANSPORT AIRCRAFT CERTIFICATION BRANCH DAO # 01-O-01	
APPROVED	
BY: <i>[Signature]</i>	D. SHEPHERD (DE # 02)
DATE: 11.04.01	
CERT. NO.: SH01-9	
ISSUE NO.: 3	

DESIGN		DART AEROSPACE LTD	
DRAWN	<i>[Signature]</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>[Signature]</i>	DRAWING NO. DSI 9549	REV. A
MFG. APPR.	<i>[Signature]</i>	SHEET 2 OF 3	
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**FIGURE 3 - CHAFING SHIELD
INSTALLATION ON D412-664-203**

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED

BY: *[Signature]*
D. SHEPHERD (DE # 02)

DATE: 11.04.01
CERT. NO.: SH01-9
ISSUE NO.: 3

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MFG. APPR.		DSI 9549	SHEET 3 OF 3
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